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Ms. Leslie Blake
Remedial Project Manager
Superfund Division
U.S. EPA, Region 5
77 West Jackson Boulevard (SR-6J)
Chicago, Illinois 60604

July 31, 2017

Subject: Estimated Costs for Vapor Intrusion Mitigation at Eight Locations at the Keystone Corridor Groundwater Contamination Site, Marion, County, Indiana

Dear Ms. Blake,

Per the U.S. Environmental Protection Agency's (U.S. EPA's) request, please find attached a Class 4 cost estimate for the mitigation of vapor intrusion at eight specific existing structures identified during remedial investigation (RI) activities completed in 2016 and 2017 at the Keystone Corridor Groundwater Contamination Site (Site). The expected accuracy range of the estimate is -30% to +50%. The mitigation costs include sealing of building slabs, diagnostic testing, and the installation of vapor intrusion mitigation system (VIMS). Also included are costs for work planning, permitting, and 5 years of VIMS operation and maintenance with associated reporting. For comparison, as requested, an alternative is also presented for 5 years of monitoring at 20 structures without active mitigation.

This costing effort was completed prior to and outside of the sitewide feasibility study (FS) currently underway as part of the RI/FS process for Work Assignment 215, which will evaluate all media, pathways, and receptors. It is assumed that this costing information will be included in the FS yet to be written.

For any questions regarding this material, please do not hesitate to contact me at 513-587-7013 or via email at brett.fishwild@ch2m.com.

Regards,
CH2M HILL, Inc.

A handwritten signature in black ink that reads 'Brett A. Fishwild'.

Brett A. Fishwild
Site Manager

Summary of Cost Analysis

Keystone Corridor - Interim ROD VIMS Estimates

Alternatives		Alternative 1 No Action			Alternative 2 Indoor Air and/or Subslab Monitoring at 20 Structures with VIMS			Alternative 3 Identification and Sealing of Vapor Entry Points, Diagnostic Testing, VIMS Installation/Startup/Commissioning		
Alternative Evaluation Timeframe ¹		5 years			5 years			5 years		
		-30%	Estimate	+50%	-30%	Estimate	+50%	-30%	Estimate	+50%
Total Implementation Costs		\$0	\$0	\$0	\$35,000	\$50,000	\$75,000	\$808,000	\$1,154,441	\$1,732,000
Present Value of Future Costs	Discount Rate of 0.4% (OMB, 2014)	\$0	\$0	\$0	\$355,000	\$507,626	\$761,000	\$192,000	\$273,639	\$410,000
Grand Total Present Value	Discount Rate of 0.4% (OMB, 2014)	\$0	\$0	\$0	\$390,000	\$557,626	\$836,000	\$1,000,000	\$1,428,000	\$2,142,000

Notes and References:

¹ The 5-year timeframe evaluated is for VIMS installation through the first Five Year Review. VIMS operation, maintenance, and monitoring will need to continue until the VI pathway is no longer capable of being completed.

- The "Real" Discount Rate used to calculate the Present Value cost is 0.4% for a timeframe of 5-years per the Office of Management and Budget (OMB), Circular A-94, Appendix C, Revised December 2014, "Discount Rates for Cost Effectiveness, Lease Purchase, and Related Analysis"

The Real Discount Rates are a forecast of real interest rates from which the inflation premium has been removed and based on the economic assumptions from the December 2014 Budget Baseline. These real rates are to be used for discounting constant-dollar flows, as is often required in cost-effectiveness analysis.

- USEPA. 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. OSWER Directive 9355.3-01. EPA/540/G-89/004. October.
- USEPA. 2000. *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*. With the U.S. Army Corps of Engineers. OSWER 9355.0-75. EPA 540-R-00-002. July.

This is not an offer for construction and/or project execution.

These AACE Classification Class 4 cost estimates are assumed to represent the actual total installed cost within the range of -30 percent to +50 percent (% based on AACE) of the cost indicated. It would appear prudent that internal budget allowances account for the highest cost indicated by this range as well as other site specific allowances. The cost estimate has been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, implementation schedule, and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.

Alternative 1: No Action

Keystone Corridor - Interim ROD VIMS Estimates

Item/Activity	Qty	Unit	Unit Cost	Cost	Notes & Comments
IMPLEMENTATION COST					
No Action			\$0	\$0	
Subtotal				\$0	
Contingency	25%			\$0	
Project Management	10%			\$0	
General Conditions and Administration (G&A)	7%			\$0	
Overhead & Profit	8%			\$0	
Total Implementation Cost				\$0	
FUTURE COSTS (5 years)					
No Action			\$0	\$0	
Laboratory and DV Report					
Subtotal			\$0	\$0	
Contingency	25%		\$0	\$0	
Project Management	10%		\$0	\$0	
G&A	7%		\$0	\$0	
Overhead & Profit	8%		\$0	\$0	
Subtotal			\$0	\$0	
Semi-Annual Monitoring			\$0		
Semi-Annual Total Future Cost				\$0	
Present Value _(0.4%) of Future Cost Semi-Annual Monitoring	5	year	0.4%	\$0	
Total Present Value _(0.4%) of All Future Costs				0.4%	\$0
					Y2017 PV calculated for 5-yrs-future-cost using 0.4% Real Discount Rate per Office of Management and Budget (2014) guidance.

Other Notes and References:

The 5-year timeframe evaluated assumes costs through the first 5-Year Review.

- The "Real" Discount Rate used to calculate the Present Value cost is 0.4% for a timeframe of 5-years per the Office of Management and Budget (OMB), Circular A-94, Appendix C, Revised December 2014, "Discount Rates for Cost Effectiveness, Lease Purchase, and Related Analysis"
- USEPA. 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* . OSWER Directive 9355.3-01. EPA/540/G-89/004. October.
- USEPA. 2000. *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study* . With the U.S. Army Corps of Engineers. OSWER 9355.0-75. EPA 540-R-00-002. July.

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Alternative 2: Indoor Air and/or Subslab Monitoring at 20 Structures with VIMS

Keystone Corridor - Interim ROD VIMS Estimates

Item/Activity	Qty	Unit	Unit Cost	Cost	Notes & Comments
IMPLEMENTATION COST					
Work Plan for Indoor Air Monitoring at 20 Structures with VIMS					
Work Plan for Sampling	1	each	\$40,000	\$40,000	Pre-Draft, Draft, Draft Final, & Final. Includes Scoping sessions.
Subtotal				\$40,000	
Project Management	10%			\$4,000	
General Conditions and Administration (G&A)	7%			\$2,800	
Overhead & Profit	8%			\$3,200	
Total Implementation Cost				\$50,000	
FUTURE COSTS (5 years)					
Semi Annual Monitoring at 20 Structures with VIMS - Year 1 and 2					
Labor	4	each	\$13,500	\$54,000	Assume 2 people for 50 hours/event @ \$135/hr
Laboratory and DV	4	each	\$20,177	\$80,708	BOA Rates
Report	4	each	\$15,000	\$60,000	Tech Memo Summary of Results
Subtotal			\$48,677	\$194,708	
Contingency	25%		\$12,169	\$48,677	
Project Management	10%		\$4,868	\$19,471	
G&A	7%		\$3,407	\$13,630	
Overhead & Profit	8%		\$3,894	\$15,577	
Subtotal			\$73,016	\$292,063	
Semi-Annual Monitoring Year 1 and 2			\$146,031		
Semi-Annual Total Future Cost				\$292,063	
Present Value _(0.4%) of Future Cost Semi-Annual Monitoring	2	year	0.4%	\$290,320	Year 1 and 2
Annual Monitoring at 20 Structures with VIMS - Years 3-5					
Labor	3	each	\$13,500	\$40,500	Assume 2 people for 50 hours/event @ \$135/hr
Laboratory and DV	3	each	\$20,177	\$60,531	BOA Rates
Report	3	each	\$15,000	\$45,000	Tech Memo Summary of Results
Subtotal			\$48,677	\$146,031	
Contingency	25%		\$12,169	\$36,508	
Project Management	10%		\$4,868	\$14,603	
G&A	7%		\$3,407	\$10,222	
Overhead & Profit	8%		\$3,894	\$11,683	
Subtotal			\$73,016	\$219,047	
Monitoring Years 3-5			\$73,016		
Total Future Cost				\$219,047	
Present Value _(0.4%) of Future Cost Monitoring (Years 3-5)	3	year	0.4%	\$217,306	Years 3-5
Total Present Value _(0.4%) of All Future Costs			0.4%	\$507,626	Y2017 PV calculated for 5-yrs-future-cost using 0.4% Real Discount Rate per Office of Management and Budget (2014) guidance.

Other Notes and References:

The 5-year timeframe evaluated assumes monitoring through the 5 year review.

- The "Real" Discount Rate used to calculate the Present Value cost is 0.4% for a timeframe of 5-years per the Office of Management and Budget (OMB), Circular A-94, Appendix C, Revised December 2014, "Discount Rates for Cost Effectiveness, Lease Purchase, and Related Analysis"
- USEPA. 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* . OSWER Directive 9355.3-01. EPA/540/G-89/004. October.
- USEPA. 2000. *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study* . With the U.S. Army Corps of Engineers. OSWER 9355.0-75. EPA 540-R-00-002. July.

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These AACE Classification Class 4 cost estimates are assumed to represent the actual total installed cost within the range of -30 percent to +50 percent (% based on AACE) of the cost indicated. It would appear prudent that internal budget allowances account for the highest cost indicated by this range as well as other site specific allowances. The cost estimate has been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, implementation schedule, and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.

Analysis/Test	Sample Matrix	Field Samples	Field Duplicates	Total Number of Air Samples Samples	Unit Price	Subtotal Cost	Total Analytical Cost
Monitoring							
Assume 7 Events over Five Years							
Air and Soil Gas Sampling							
Volatiles in Air	Air	13	2	15	\$199.61	\$2,994.15	\$2,994.15
Media Preparation - 6L SUMMA Canister with Batch Certification	NA	13	2	15	\$33.42	\$501.30	\$501.30
Flow Controller/Regulator for SUMMA Canister	NA	13	2	15	\$25.89	\$388.35	\$388.35
T- Connection for SUMMA Canister	NA	0	2	2	\$14.06	\$28.12	\$28.12
Weekly Rental for 6L SUMMA Canister	NA	13	2	15	\$44.55	\$668.25	\$668.25
Volatiles in Soil Gas	Soil Gas	40	4	44	\$199.61	\$8,782.84	\$8,782.84
Media Preparation - 1L SUMMA Canister with Batch Certification	NA	40	5	45	\$41.88	\$1,884.60	\$1,884.60
Flow Controller/Regulator for SUMMA Canister	NA	40	5	45	\$25.89	\$1,165.05	\$1,165.05
T- Connection for SUMMA Canister	NA	0	5	5	\$14.06	\$70.30	\$70.30
Weekly Rental for 1L SUMMA Canister	NA	40	5	45	\$51.36	\$2,311.20	\$2,311.20
Subtotal							\$18,794.16
TOTAL LAB COST PER EVENT							\$18,794.16

Alternative 3 - MNA and LUCs
Data Validation Backup
OU 1 FS, MCAS Cherry Point

Analysis/Test	Sample Matrix	Field Samples	Field Duplicates	Total Number of Air and Soil Gas Samples	Total Billable Air Samples	Air and Soil Gas Unit Price	Air and Soil Gas Subtotal Cost	Total DV Cost
LTM								
Assume Seven Events over Five Years								
Air and Soil Gas Samples								
TCL VOCs	Air	53	6	59	59	\$23.44	\$1,382.96	\$1,382.96
Subtotal								\$1,382.96
TOTAL FUTURE DV COST Per Event								\$1,382.96

Alternative 3: Identification and Sealing of Vapor Entry Points, Diagnostic Testing, VIMS Installation/Startup/Commissioning
 Keystone Corridor - Interim ROD VIMS Estimates

Item/Activity	Qty	Unit	Unit Cost	Cost	Notes & Comments
IMPLEMENTATION COST					
Mitigation Work Plan, Data Evaluation, and VIMS layout					
Work Plans	1	Each	\$60,000	\$60,000	Mitigation work plan, data evaluation, and VIMS layout. Includes scoping sessions.
Air Permitting Equivalency					
Air Permit Requirements Evaluation	1	LS	\$10,000	\$10,000	Using offgas data from diagnostic testing
VIMS Sealing, Diagnostic Testing, and Installation by Building					
CP-002					
Sealing					
Equipment and Subcontractor					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew - \$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew - \$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew - \$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	1	Each	\$3,500	\$3,500	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	50	LF	\$50	\$2,500	Assume 50 ft of piping for each node
CP-013/Gym					
Sealing					
Equipment and Subcontractor					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew - \$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew - \$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew - \$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	2	Each	\$3,500	\$7,000	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	100	LF	\$50	\$5,000	Assume 50 ft of piping for each node
CP-013/Thomas Catering Warehouse - Vacant					
Sealing					
Equipment and Subcontractor					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew - \$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew - \$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew - \$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	1	Each	\$3,500	\$3,500	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	50	LF	\$50	\$2,500	Assume 50 ft of piping for each node

CP-016/Woodshop					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	3	Each	\$3,500	\$10,500	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	150	LF	\$50	\$7,500	Assume 50 ft of piping for each node
CP-016/Schouten Metal					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	4	Each	\$3,500	\$14,000	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	200	LF	\$50	\$10,000	Assume 50 ft of piping for each node
CP-016/Taylor's Automotive - Auto Shop					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	2	Each	\$3,500	\$7,000	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	100	LF	\$50	\$5,000	Assume 50 ft of piping for each node
CP-016/Keystone Glass					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	2	Each	\$3,500	\$7,000	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	100	LF	\$50	\$5,000	Assume 50 ft of piping for each node

CP-016/Storage - Infrequent Occupancy					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	2	Each	\$3,500	\$7,000	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	100	LF	\$50	\$5,000	Assume 50 ft of piping for each node
CP-016/Mahan Turf - Infrequent Occupancy					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	2	Each	\$3,500	\$7,000	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	100	LF	\$50	\$5,000	Assume 50 ft of piping for each node
CP-017/Lawn Care Storage - Infrequent Occupancy					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	1	Each	\$3,500	\$3,500	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	50	LF	\$50	\$2,500	Assume 50 ft of piping for each node
CP-017/Vacant - House inside warehouse					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	2	Each	\$3,500	\$7,000	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	100	LF	\$50	\$5,000	Assume 50 ft of piping for each node

CP-017/Home Improvement Office/Workshop					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	1	Each	\$3,500	\$3,500	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	50	LF	\$50	\$2,500	Assume 50 ft of piping for each node
CP-018/Indianapolis Rack and Axle					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	6	Each	\$3,500	\$21,000	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	300	LF	\$50	\$15,000	Assume 50 ft of piping for each node
CP-023/Vacant					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	2	Each	\$3,500	\$7,000	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	100	LF	\$50	\$5,000	Assume 50 ft of piping for each node
CP-023/Walker Irrigation					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	2	Each	\$3,500	\$7,000	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	100	LF	\$50	\$5,000	Assume 50 ft of piping for each node

CP-023/Lawn Care					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	2	Each	\$3,500	\$7,000	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	100	LF	\$50	\$5,000	Assume 50 ft of piping for each node
CP-023/Schweidler Construction					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	2	Each	\$3,500	\$7,000	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	100	LF	\$50	\$5,000	Assume 50 ft of piping for each node
CP-023/Chicharo Auto					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	2	Each	\$3,500	\$7,000	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	100	LF	\$50	\$5,000	Assume 50 ft of piping for each node
CP-024/Insulation Office and Warehouse (Fargo Insulation)					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	2	Each	\$3,500	\$7,000	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	100	LF	\$50	\$5,000	Assume 50 ft of piping for each node

CP-027/Vacant auto shop					
Sealing					
<i>Equipment and Subcontractor</i>					
Mobilization and Site Setup	1	LS	\$1,500	\$1,500	Mobilizations will be combined where practical
Labor - 2-person Crew	20	Hours	\$65	\$1,300	Sealing, wall reconstructions, sealing utility penetrations; Average Labor Rate for 2 person crew -\$65/hr; 1 day, 10-hr day
Elastomeric Polymer	20	Tube	\$8	\$160	
PID Rental	1	Days	\$100	\$100	
Misc Materials	1	LS	\$250	\$250	
Travel and Per Diem for Subcontractor	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem for Oversight	1	Days	\$135	\$135	
Diagnostic Testing					
Labor - 2-person Crew	20	Hours	\$65	\$1,300	2 people, 1 day, 10-hr day; Average labor rate \$65
Miscellaneous Supplies	1	LS	\$500	\$500	
Exhaust Sampling	1	Each	\$350	\$350	Exhaust sampling and analysis, including shipping
Labor - Oversight	10	Hours	\$135	\$1,350	Labor Rate for 1 person crew -\$135/hr; 1 day, 10-hr day
Travel and Per Diem	2	Days	\$135	\$270	Lodging and Per diem of \$135/day/person
VIMS Installation					
Labor - 3-person Crew	30	Hours	\$65	\$1,950	Average Labor Rate for 3 person crew - \$65/hr, 1 day, 10-hr day
Node Installation	3	Each	\$3,500	\$10,500	
Mitigation Fan	1	Each	\$750	\$750	
Electrician	4	Hours	\$150	\$600	For installation of mitigation fan, 4 hour minimum assumed
Miscellaneous Materials	1	LS	\$750	\$750	
Piping Installation [4" diameter piping]	150	LF	\$50	\$7,500	Assume 50 ft of piping for each node
VIMS Installation, Startup, and Commissioning					
Oversight - VIMS Startup and Commissioning	440	hours	\$135	\$59,400	1/2 day per structure; 44-days at ten hours for startup assessment
Mobilization and Site Setup - VIMS Startup and Commissioning	1	LS	\$10,000	\$10,000	
Laboratory Analyses - 1 event	1	LS	\$18,794	\$18,794	From Tab Alt_2_Lab
Data Validation - 1 event	1	LS	\$1,383	\$1,383	From Tab Alt_2_DV
Travel and Per Diem - VIMS Startup and Commissioning	45	days	\$135	\$6,075	3-person crew for 15 days
Oversight - VIMS Installation	150	hour	\$135	\$20,250	Construction manager for 15 days, 10-hr Days
Oversight Travel and Per Diem - VIMS Installation	15	days	\$135	\$2,025	
Construction Report					
	1	each	\$60,000	\$60,000	Draft and Final Construction Completion Report, includes Data Validation and Evaluation
<i>Subtotal (VIMS Sealing, Diagnostic Testing, and Installation by Building)</i>				\$769,627	
<i>Contingency</i>	25%			\$192,407	
<i>Project Management</i>	10%			\$76,963	
<i>G&A</i>	7%			\$53,874	
<i>Overhead & Profit</i>	8%			\$61,570	
Total Implementation Cost				\$1,154,441	
FUTURE COSTS (5 years of O&M to first Five Year Review)					
Annual					
Labor	5	each	\$8,100	\$40,500	Assume 2 people for 30 hours/event @ \$135/hr:
Field Equipment	5	each	\$500	\$2,500	Rental of field equipment for measurement of physical parameters, including micro-manometer and anemometer
Laboratory and DV	0	each	\$20,177	\$0	Key Assumption - Will rely on physical operation parameters
Report	5	each	\$8,000	\$40,000	Tech Memo Summary of Results
<i>Subtotal</i>			\$36,777	\$83,000	
<i>Contingency</i>	25%		\$9,194.28	\$20,750	
<i>Project Management</i>	10%		\$3,678	\$8,300	
<i>G&A</i>	7%		\$2,574	\$5,810	
<i>Overhead & Profit</i>	8%		\$2,942	\$6,640	
<i>Subtotal</i>			\$55,166	\$124,500	
Monitoring Years 1-5			\$55,166		
Monitoring Total Future Cost				\$124,500	
<i>Present Value_(0.4%) of Future Cost Monitoring</i>	5	year	0.4%	\$273,639.30	First Year of Monitoring not Discounted
Total Present Value_(0.4%) of All Future Costs				\$273,639	Y2017 PV calculated for 5 yrs future cost using 0.4 Real Discount Rate per Office of Management and Budget (2014) guidance.

Other Notes and References:

• The "Real" Discount Rate used to calculate the Present Value cost is 0.4% for a timeframe of 5-years per the Office of Management and Budget (OMB), Circular A-94, Appendix C, Revised December 2014, "Discount Rates for Cost Effectiveness, Lease Purchase, and Related Analysis"

The Real Discount Rates are a forecast of real interest rates from which the inflation premium has been removed and based on the economic assumptions from the December 2014 Budget Baseline. These real rates are to be used for discounting

• USEPA. 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. OSWER Directive 9355.3-01. EPA/540/G-89/004. October.

• USEPA. 2000. *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*. With the U.S. Army Corps of Engineers. OSWER 9355.0-75. EPA 540-R-00-002. July.

This is not an offer for construction and/or project execution.

These AACE Classification Class 4 cost estimates are assumed to represent the actual total installed cost within the range of -30 percent to +50 percent (% based on AACE) of the cost indicated. It would appear prudent that internal budget allowances account for the highest cost indicated by this range as well as other site specific allowances. The cost estimate has been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, implementation schedule, and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.

Property ID	Property Type	Address	Building Description	Sample Location ID	Floor	Indoor Air Samples	Crawlspace Air Samples	Outdoor Air Samples	Subslab Soil Gas Samples	Total Area (sq. ft.) as Measured During Building Surveys	Google Earth Estimate	Number of Floors	Number of Rooms	Basement?	Basement Area (sq. ft.)	Sumps, Floor Drains Present?
CP-002	Commercial					1	0	0	0	1344		1	7	No	-	No
CP-013	Commercial	2326 E 44th St	Gym	SS-01	Ground	1	0	0	2	2736	4080	1	7	No	-	No
				SS-02	Ground											
				IA-02	Ground											
			Thomas Catering Warehouse - Vacant	SS-03	Ground	0	0	0	1	1178	1	2	No	-	No	
CP-016	Commercial	2203 E 44th St	Woodshop	SS-01	Ground	1	0	0	2	3481	3906	1	6	No	-	No
				SS-02	Ground											
				IA-01	Ground											
		2211 E 44th St	Schouten Metal	SS-03	Ground	1	0	0	2	4560	4860	1	5	No	-	No
				SS-04	Ground											
				IA-02	Ground											
		2215 E 44th St	Taylor's Automotive - Auto Shop	SS-05	Ground	0	0	0	2	2124	2400	1	6	No	-	Yes
				SS-06	Ground											
		2217 E 44th St	Keystone Glass	SS-07	Ground	1	0	0	2	1596	2400	1	4	No	-	No
				SS-08	Ground											
				IA-03	Ground											
		2219 E 44th St	Storage - Infrequent Occupancy	SS-09	Ground	0	0	0	2	2242	2400	1	7	No	-	No
				SS-10	Ground											
2221 E 44th St	Mahan Turf - Infrequent Occupancy	SS-11	Ground	0	0	0	2	2166	2400	1	6	No	-	No		
		SS-12	Ground													
CP-017	Commercial	2223 E 44th St Ste A	Lawn Care Storage - Infrequent Occupancy	SS-01	Ground	0	0	0	2	1496		1	8	No	-	No
				SS-02	Ground											
		2223 E 44th St	Vacant - House inside warehouse	SS-03	Basement	0	0	0	2	2324	5250	2	11	Yes	768	No
				SS-04	Ground											
		2225 E 44th St	Home Improvement Office/Workshop	SS-05	Ground	1	0	1	2	1059		1+	4	No	-	No
				SS-06	Ground											
OA-01	Ground															
CP-018	Commercial	2301 E 44th St	Indianapolis Rack and Axle	SS-01	Ground	0	0	0	3	7952	10700	1	11	No	-	No
				SS-02	Ground											
				SS-03	Ground											

Property ID	Property Type	Address	Building Description	Sample Location ID	Floor	Indoor Air Samples	Crawlspace Air Samples	Outdoor Air Samples	Subslab Soil Gas Samples	Total Area (sq. ft.) as Measured During Building Surveys	Google Earth Estimate	Number of Floors	Number of Rooms	Basement?	Basement Area (sq. ft.)	Sumps, Floor Drains Present?
CP-023	Commercial	2124 Clay St	Vacant	SS-01	Ground	0	0	0	2	2100	4500	1	6	No	-	Yes
				SS-02	Ground											
		2126 Clay St	Walker Irrigation	SS-03	Ground	1	0	0	2	2016	Unknown	1	5	No	-	No
				SS-04	Ground											
				IA-01	Ground											
		2128 Clay St	Lawn Care	SS-05	Ground	1	0	0	2	2016	2888	1	8	No	-	No
				SS-06	Ground											
				IA-02	Ground											
		2130 Clay St	Schweidler Construction	SS-07	Ground	1	0	0	2	2204	Unknown	1	4	No	-	No
				SS-08	Ground											
				IA-03	Ground											
		2132 Clay St	Chicharo Auto	SS-09	Ground	1	0	0	2	1596	Unknown	1	4	No	-	Yes
SS-10	Ground															
IA-04	Ground															
CP-024	Commercial	2120 Clay St	Insulation office and warehouse (Fargo Insulation)	SS-01	Ground	1	0	0	3	2425	5750	1.5	16	No	-	No
				SS-02	Ground											
				SS-03	Ground											
				IA-01	Ground											
CP-027	Commercial	2102 Clay St	Vacant auto shop	SS-01	Ground	0	0	0	2	3654	4606	1	10	No	-	Yes
				SS-02	Ground											
RP-042	Residential	4301 Evanston Ave	Residential	CS-01	Crawl Space	1	1	0	1	Unknown	1596 (excluding basement)	2	13	Yes	650	No
				SS-01	Basement											
				IA-01	Basement											
Total						11	1	1	40							

Property ID	Cracks in Lower Level Walls or Floor?	Crawlspace?	Garage?	Roof Type?	Estimated # of Nodes	QC Step: Rationale for Inclusion/VIMS	Other Notes
CP-002	No	No	No	Flat	1	VISL exceedance of PCE and/or TCE at one indoor air location	
CP-013	No	No	No	Flat	2	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	
	Yes	No	No	Flat	1	VISL exceedance of PCE and/or TCE at one subslab soil gas locations	
CP-016	Yes	No	Yes	Flat	3	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	It is unknown whether this building compartment has a stemwall that separates the subslab from the rest of the building.
	No	No	Yes	Flat	4	VISL exceedance of PCE and/or TCE at one subslab soil gas locations	
	No	No	Yes	Flat	2	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	No mention of drain in survey form, but shown on sketch
	No	No	No	Flat	2	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	Potentially has floor drains. Sketch unclear. Survey form does not say.
	No	No	Yes	Flat	2	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	
	Yes	No	Yes	Flat	2	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	Unclear on number of rooms, whether or not sizeable cracks are present. Potential floor drain.
CP-017	Yes	No	Yes	Flat	1	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	Dimensions are up for interpretation, therefore area may be off slightly. Sketch unclear on the number of rooms.
	No	No	Yes	Flat	2	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	Number of rooms is unclear on sketch
	No	No	Yes	Flat	1	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	Stairwell shown in sketch leading to second floor, however building survey indicates only 1 floor. Google Earth indicates multiple floors.
CP-018	No	No	Yes	Flat	6	VISL exceedance of PCE and/or TCE at three subslab soil gas locations	

Property ID	Cracks in Lower Level Walls or Floor?	Crawlspace?	Garage?	Roof Type?	Estimated # of Nodes	QC Step: Rationale for Inclusion/VIMS	Other Notes
CP-023	Yes	No	Yes	Flat	2	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	Potentially has floor drains. Sketch shows one. Survey form does not say.
	Yes	No	Yes	Unknown, likely flat	2	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	
	Yes	No	Yes	Flat	2	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	
	Yes	No	Yes	Unknown, likely flat	2	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	
	No	No	Yes	Unknown, likely flat	2	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	Dimensions missing on sketch. Area approximated based on relative dimensions. Survey form indicates no floor drain. Sketch indicates otherwise.
CP-024	Yes	No	Yes	Sloped/flat	2	VISL exceedance of PCE and/or TCE at three subslab soil gas locations	
CP-027	Yes	No	Yes	Flat	3	VISL exceedance of PCE and/or TCE at two subslab soil gas locations	Building survey indicates basement sump, but not basement.
RP-042	No	Yes	Yes	Sloped	2	VISL exceedance of PCE and/or TCE at one subslab soil gas locations	Dimensions for first floor missing. Estimated nodes based off of Google Earth estimate.